इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 10103 (1982): Method for test for ferrule type couplings used in oil-hydraulic systems [PGD 17: Fluid Power Fittings, Hoses and Hose Assemblies]

"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

AMENDMENT NO. 3 MARCH 2002
TO
IS 10103 : 1982 METHOD OF TEST FOR FERRULE TYPE COUPLINGS USED IN OIL-HYDRAULIC SYSTEMS

(*Page* 1, *clause* 4.7, *second sentence*) — Substitute the following for the existing:

'On each reassambly, the coupling shall be tightened in accordance with the assembly instructions laid down by the manufacturer.'

(BP 17)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 2 JANUARY 1996
TO
IS 10103 : 1982 METHOD OF TEST FOR FERRULE TYPE COUPLINGS USED IN OIL-HYDRAULIC SYSTEMS

(*Page* 1, *clause* 3.2) — Substitute 'or' in place of 'and' after ISO VG 46.

(PE 17)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 1 OCTOBER 1984

TO

IS: 10103-1982 METHOD OF TEST FOR FERRULE TYPE COUPLINGS USED IN OIL HYDRAULIC SYSTEMS

Addendum

(*Page 3, clause 5.5*) - Add the following new clauses after 5.5:e 5.5:

'6. Classification of Tests

6.1 *Routine Inspection Test* - The proof pressure test given at 4.6 shall constitute routine inspection test!

6.2 *Type Tests* - All the tests given at 4.6 to 4.10 shall constitute type tests.'

(EDC 73)

Reprography Unit, ISI, New Delhi, India

UDC 621·643·415/·418-822 : 620·1

IS : 10103 - 1982

Indian Standard

METHOD OF TEST FOR FERRULE TYPE COUPLINGS USED IN OIL-HYDRAULIC SYSTEMS

Fluid Power Systems and Components Sectional Committee, EDC 73; Component Testing Subcommittee, EDC 73 : 4 [Ref : Doc : EDC 73 (2925)]

1. Scope — Specifies a test procedure for evaluating performance requirements of ferrule type couplings used in oil-hydraulic systems.

2. Definitions — For definitions of terms used in this standard, refer to 'Indian Standard Glossary of terms relating to fluid power' (*under preparation*).

3. Test Conditions

3.1 Suitable rigs for different tests specified in **4.6** to **4.10**.

3.2 The test fluid shall be a fully fortified hydraulic mineral oil having a viscosity grade of ISO VG 46 and ISO VG 32 (*see* IS : 9466-1980 Indian Standard for viscosity classification for industrial liquid lubricants).

Note — Other oils may be used by agreement between the user and the manufacturer.

3.3 The accuracy of measurement of pressure shall be within ±3 percent.

3.4 The cold drawn seamless steel tubes used for testing of couplings shall be in accordance with *IS : 8305 (Part I) - 1978 'General requirements for ferrule type couplings used in oil hydraulic* systems : Part I General ' and IS : 6631 - 1972 ' Specification for steel pipes for hydraulic purposes '.

3.5 All couplings under test shall conform to the requirements specified in IS : 8805 (Part I) - 1978.

4. Test Procedure

4.1 All couplings under test shall be assembled in accordance with the manufacturer's recommendations.

4.2 The tests specified shall be carried out on couplings drawn at random.

4.3 The tests shall be carried out by making suitable test assemblies as shown in Table 1.

4.4 The tests specified in **4.6**, **4.8** and **4.10** are considered hazardous It is, therefore, recommended that while conducting these tests all appropriate safety precautions be adhered to. Before starting any hydraulic test, the system is to be bled off of any air in order to minimize the energy released in the event of any failure.

4.5 The tests specified in **4.6**, **4.8** and **4.9** shall be carried out at a temperature of 20 to 40°C and test specified in **4.10** shall be carried out at 55 ± 5°C.

4.6 *Proof Pressure Test* — Three test assemblies made up of couplings selected (*see* Table 1) shall be subjected to a pressure of 1·5 times the maximum working pressure of the couplings. The pressure is applied gradually at a rate of 0 15 to 0 35 MPa/s (1·5 to 3·5 kgf/cm²/s) and maintained at the specified proof-pressure for 5 min.

4.7 *Dismantling and Reassembly* — Three test assemblies which have successfully completed test **4.6** shall have all the couplings fully dismantled and reassembled six times. On each reassembly, the coupling shall be tightened in accordance with assembly instructions given in Indian Standard for general requirements for ferrule type couplings used in oil hydraulic system : Part II Survey of coupling assemblies and assembly procedure (*under preparation*). The assemblies shall be then subjected to proof pressure test as per **4.6** above.

Adopted 22 February 1982

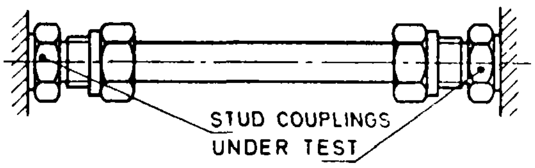
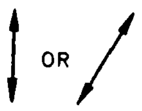
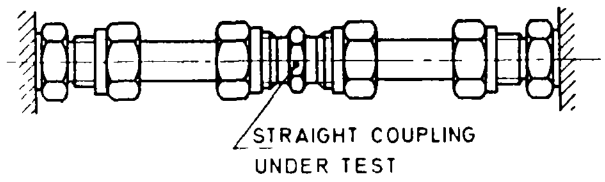
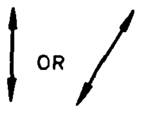
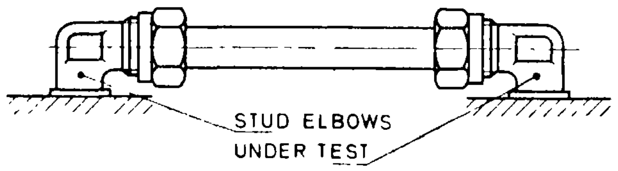
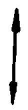
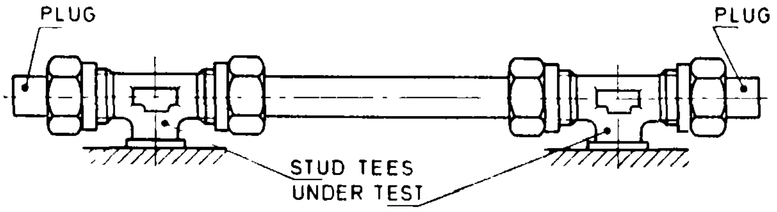
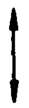
© June 1982, ISI

Price Rs **6·00**

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

TABLE 1 PROOF PRESSURE TEST

(*Clause* 4.6)

Sl No.	Type of Coupling Assembly	Test Assembly	Direction of Mechanical Vibration for Impulse Test
1	Male stud coupling assembly		
2	Straight coupling assembly		
3	Male stud elbow assembly		
4	Male stud tee assembly		

Note 1 — The pluggings used for the test should not fail during the test.

Note 2 — The test assemblies shall be fixed at one end and free at the other.

4.8 *Burst Test* — Three test assemblies which have completed test (**4.6**) shall be subjected to a pressure four times the maximum working pressure of the coupling. The pressure is applied gradually at a rate of 0·15 to 0·35 MPa/s (1·5 to 3·5 $kgf/cm^2/s$) till the burst pressure is reached.

4.9 *Vacuum Test* — Three test assemblies which have successfully completed test (**4.6**) shall be subjected to a vacuum of 710 mm of mercury and kept isolated from the vacuum pump for 15 min.

4.10 *Pressure Impulse Test and Vibrations* — Three test assemblies which have completed successfully test (**4.6**) shall be subjected to a hydrostatic pressure impulse test along with the vibrations as specified in Tables 2 and 3. On account of the possibility of bedding in, it is permissible to retighten once within the first thousand cycles of the test. The impulse and vibration frequencies shall be so chosen that the tests terminate simultaneously.

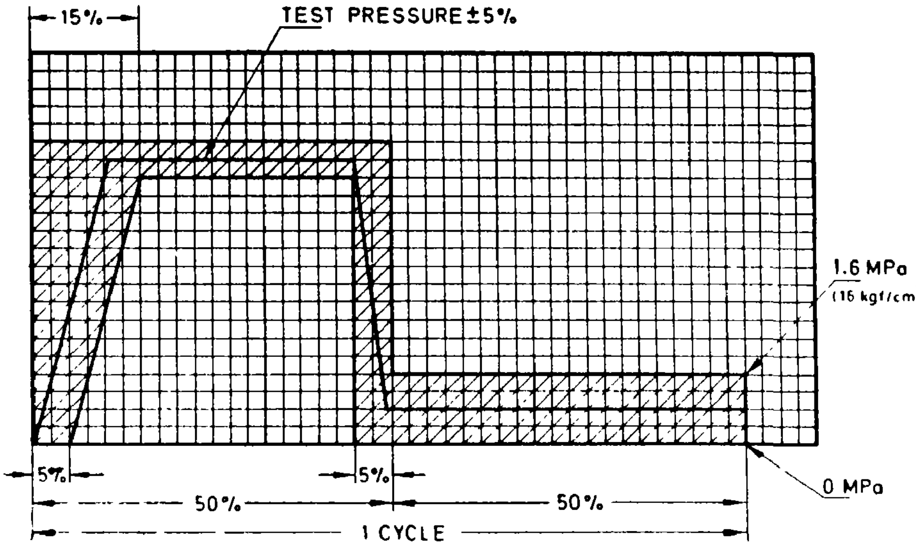
5. Test Results

5.1 The couplings shall not leak during the proof pressure test.

5.2 After dismantling and reassembly tests (*see* **4.7**), the test assemblies shall then successfully complete the proof pressure test (*see* **4.6**).

TABLE 2 IMPULSE TEST

(*Clause* 4.10)

Parameter	**Details**
Test pressure	1·33 times maximum pressure
Test cycle	 15% TEST PRESSURE±5% 1.6 MPa (16 kgf/cm²) 0 MPa 5% 5% 50% 50% 1 CYCLE
Total number of cycles	200 000 (*Min*)
Frequency of cycling	30 to 100 cycles per minute

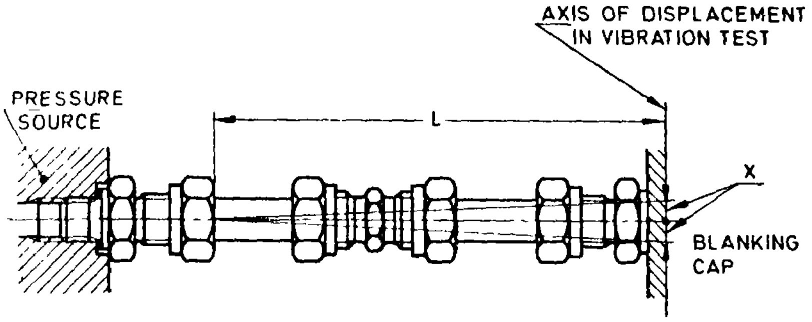
5.3 The couplings shall not leak below the specified burst test pressure (*see* **4.8**).

5.4 At the end of the vacuum test, vacuum shall not have reduced by more than 38 mm of mercury.

5.5 At no time after retightening, if any, during the impulse test and vibrations, the test assemblies shall leak in excess of 1 cm^3/h/assembly.

TABLE 3 PRESSURE IMPULSE TEST AND VIBRATIONS

(*Clause* 4.10)

1	 AXIS OF DISPLACEMENT IN VIBRATION TEST PRESSURE SOURCE L X BLANKING CAP	Deflection $X = \frac{L^2 2S^*}{3ED}$
2	Frequency of vibrations	1 400 to 2 800 cycles/min
3	Total number of cycles	10×10^6 (*Min*)

* L = Distance in mm, from coupling nut adjacent to the point of application of vibrational force (*see* figure).

X = Displacement in mm, of assembly from rest measured at the point of application of vibrational force (half total amplitude),

E = modulus of elasticity of the material (for M.S. E = 210 GP_a),

D = Outside diamter of tube in mm, and

S = Bending stress (GP_a) based on a factor of safety of 4 on tensile yield stress of the tube material at the point of entry into the coupling nut of the fixed stud coupling.

EXPLANATORY NOTE

In the preparation of this standard, considerable assistance has been derived from Draft British Standard Specification for the testing of steel compression couplings used in hydraulic fluid power application, issued by the British Standards Institution (BSI).

Printed at New India Printing Press, Khurja, India